

Ca  
Cnald

the carbon layers include one carbon layer, and  
the silicon layers include one silicon layer.

## **REMARKS**

### **I. Introduction**

Claims 78 to 95 are pending in the present application with claims 78 to 80 withdrawn from consideration. In view of the foregoing amendments and following remarks, it is respectfully submitted that claims 81 to 95 are allowable, and reconsideration is respectfully requested.

As an initial matter, the Office Action Summary does not acknowledge the claim for foreign priority and does not acknowledge receipt of the priority documents. The present application is a division of U.S. Patent Application Serial No. 09/446,054 ("the parent application") and claims priority to Application No. 197 25 383.0, filed in the Federal Republic of Germany on June 16, 1997. The claim for priority was made in the Combined Declaration and Power of Attorney for Patent Application, which was filed in the parent application and a copy of which was filed in the present application. A copy of the certified copy of the priority application can be found in the parent application, U.S. Patent Application Serial No. 09/446,054. Applicant therefore request that the claim for priority be acknowledged in the next Office communication and that the receipt of the priority document be acknowledged in the next Office communication.

Applicants thank the Examiner for considering the previously filed Information Disclosure Statement, PTO-1449 paper and cited references.

### **II. Rejection of Claims 81 to 95 Under 35 U.S.C. § 112, Second Paragraph**

Claims 81 to 95 were rejected under 35 U.S.C. § 112, second paragraph as indefinite for allegedly failing to particularly point out and distinctly claim the subject matter of the invention. The Office Action alleges that it is unclear how layers in claim 81 are alternated. The Office Action additionally questions if there are two or three layers in the claimed structure.

Claim 81 recites a multilayer structure having alternating individual hard-material layers and one of individual carbon layers and individual silicon layers. Claim 81 requires individual hard-material layers (plural) and one of carbon layers (plural) and silicon layers (plural). The hard-material layers and either the carbon or

silicon layers are alternated. As a minimum, therefore, there are two layers of hard-material and two layers of carbon or silicon.

The second paragraph of 35 U.S.C. § 112 merely requires that "the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity." M.P.E.P. § 2173.02 (emphasis added). Furthermore, "[d]efiniteness of claim language must be analyzed, not in a vacuum, but in light of[, inter alia, the] content of the particular application disclosure[ and] the claim interpretation that would be given by one possessing the ordinary level of skill in pertinent art at the time the invention was made." Id. It is respectfully submitted that claim 81 adequately sets forth the subject matter of the invention with the required reasonable degree of clarity and particularity. In view of the foregoing, it is respectfully submitted that claim 81 fully complies with the requirements of 35 U.S.C. § 112, and withdrawal of this rejection is therefore respectfully requested.

The Office Action rejects claim 82 is indefinite, wherein it is alleged that the term "metal in 'carbon containing metal', lacks clear antecedent basis."

Office Action at p. 2. The Office Action further alleges that it is unclear what hard subgroup metals are.

Applicants have amended claim 82, without prejudice, to recite that metals are selected from hard secondary group metals. Support for this amendment may be found, for example, on page 5, line 6 of the Specification. Applicants further submit that the recitation of "the metal" is definite as all of the occurrences of "the metal" in claim 82 are secondary recitations of the feature "a metal" as contained in claim 81, line 4. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 82.

The Office Action rejects claims 91 and 92 as unclear, where the Office Action alleges that it is unknown whether there are three or two alternating layers.

Applicants submit that claims 91 and 92 are not indefinite and that the rejections should be withdrawn. Claim 91 requires that the multilayer structure have alternating C-(WC) layers (plural) and a-C:H layers (plural). As recited, at least two C-(WC) layers and two a-C:H layers are required, thereby producing a multilayer structure with at least four layers which alternate. Applicants respectfully submit that claim 91 is definite and that the rejection should be withdrawn. Claim 92 also requires that the multilayer structure have alternating MeC layers and C-(MeC)

layers. Claim 92, therefore also has at least four layers wherein the layers alternate. Applicants respectfully submit that claim 92 is definite and that the rejection should be withdrawn.

The Office Action also rejects claim 94 wherein it is alleged that the claim is not understandable based upon how boron can be contained in a carbon layer and not be simultaneously present with carbon.

Applicants respectfully submit that claim 94 is fully compliant with 35 U.S.C. 112, second paragraph and that the rejection should be withdrawn. Claim 94 requires that one of the hard material layers, the carbon layers, and the silicon layers contain at least one of silicon, boron, nitrogen, oxygen, carbon and that a metal and boron and carbon are not simultaneously present in the one the hard material layers, the carbon layers and the silicon layers. The claim specifically precludes boron and carbon from being simultaneously present in the same layers, therefore boron and carbon cannot be simultaneously present. It is respectfully submitted that claim 94 adequately sets forth the subject matter of the invention with the required reasonable degree of clarity and particularity. Applicants respectfully submit that the claim 94 fully complies with the requirements of 35 U.S.C. § 112, and withdrawal of the present rejection is therefore respectfully requested.

### **III. Rejection of Claims 81 to 95 Under 35 U.S.C. § 102(b)**

Claims 81 to 95 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,619,865 ("Keem et al."). Applicants respectfully submit that Keem et al. do not anticipate the present claims for the following reasons.

Claim 81 relates to a multilayer structure. Claim 81 recites alternating individual hard-material layers and one of individual carbon layers and individual silicon layers. Claim 81 specifies that the hard-material layers include one of a metal, a metal carbide, a metal silicide, a metal carbo-silicide, a metal siliconitride, a metal carbide containing carbon, a metal silicide-containing silicon, and a mixture of at least two of the metal, the metal carbide, the metal silicide, the metal carbo-silicide, the metal siliconitride, the metal carbide-containing carbon, and the metal silicide-containing silicon, and the metal includes one of tungsten, chromium, niobium and molybdenum.

The Office Action alleges that Keem et al. anticipate claims 81 to 95 by showing alternating layers with the same materials as recited in claims 81 to 95.

Applicants respectfully submit that Keem et al. do not anticipate claims 81 to 95 and the rejections should be withdrawn. Keem et al. require a specific combination of an alternating active layer and a soft interlayer. See, col. 6, lines 8 to 10. Keem et al. disclose that the interlayers 16 are formed of materials such as gold, silver and nickel and are used to separate the active layers 14. See, col. 6 lines 52 to 60. Active layers 14 are a selenide or telluride of a metal of Group IV, V, VI or VII of the periodic table such as  $ZrS_2$ ,  $VS_2$ ,  $NbS_2$ ,  $TaS_2$ ,  $MoS_2$ ,  $WS_2$ ,  $ReS_2$ ,  $WSe_2$ ,  $MoSe_2$ ,  $NdSe_2$ ,  $MoTe_2$  or  $WTe_2$ . See, col. 9, lines 21 to 27. The solid lubricant material are described as a fluoride such as graphite fluoride,  $CaF_2$  or  $BaF_2$ , or a chloride such as  $CdCl_2$  or  $CrCl_2$ , an iodide such as  $CdI_2$ , a nitride such as BN, an oxide such as  $PdO$ , talc,  $SbO_3$  or  $MoO_3$  or graphite. See, col. 9, lines 27 to 31. If the active layers 14 are equated to the "hard-material layers" of claim 81, then the interlayers 16 must be equated to the one of individual carbon layers and individual silicon layers. Keem et al., however, only disclose that gold, silver and nickel are used as the interlayers 16, different than the required one of individual carbon layers and individual silicon layers. Applicants further submit that if the layers 14 are equated to the one of the silicon and carbon layers, then the interlayers 16 do not disclose or even suggest a configuration of the required hard-material layers.

Applicants further submit that Keem et al. have a singular capping layer 22 used on an outside of a structure. See, col. 7 lines 58 to 60. Applicants respectfully submit that the description of a singular capping layer 22 does not constitute a disclosure, or even a suggestion, of layers (plural) of either the hard-material layers or the one of individual carbon layers and individual silicon layers.

To anticipate a claim, each and every element as set forth in the claim must be found in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). That is, the prior art must describe the elements arranged as required by the claims. In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). As more fully set forth above, it is respectfully submitted that Keem et al. do not disclose, or even suggest, all of the limitations of claim 81, including alternating individual hard-material layers and one of individual carbon layers and

individual silicon layers as recited. It is therefore respectfully submitted that Keem et al. do not anticipate claim 81.

Additionally, to reject a claim under 35 U.S.C. § 102, the Examiner must demonstrate that each and every claim limitation is contained in a single prior art reference. See, Scripps Clinic & Research Foundation v. Genentech, Inc., 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Still further, not only must each of the claim limitations be identically disclosed, an anticipatory reference must also enable a person having ordinary skill in the art to practice the claimed invention, namely the inventions of the rejected claims, as discussed above. See, Akzo, N.V. v. U.S.I.T.C., 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986). In particular, it is respectfully submitted that, at least for the reasons discussed above, the references relied upon would not enable a person having ordinary skill in the art to practice the inventions of the rejected claims, as discussed above. Also, to the extent that the Examiner is relying on the doctrine of inherency, the Examiner must provide a "basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics necessarily flows from the teachings of the applied art." See M.P.E.P. § 2112; emphasis in original; and see, Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). Thus, the M.P.E.P. and the case law make clear that simply because a certain result or characteristic may occur in the prior art does not establish the inherency of that result or characteristic. Accordingly, the anticipation rejection as to the rejected claims must necessarily fail for the foregoing reasons.

In summary, it is respectfully submitted that Keem et al. do not anticipate claim 81.

As for claims 82 to 95, which ultimately depend from claim 81 and therefore include all of the limitations of claim 81, it is respectfully submitted that Keem et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 81.

#### IV. Conclusion

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. The attached page is captioned "**Version with Markings to Show Changes Made.**"

It is therefore respectfully submitted that all pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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**Version with Markings to Show Changes Made**

**IN THE CLAIMS:**

Claims 82, 84 and 85 have been amended without prejudice as follows:

82. (Amended) The multilayer structure according to claim 81, wherein:  
the carbon layers include one of amorphous carbon containing hydrogen, amorphous hydrogen-free carbon, carbon containing silicon, and carbon containing the metal, and  
the metal is selected from hard [subgroup] secondary group metals.

84. (Amended) The multilayer structure according to claim 81, wherein:  
the hard material layers include at least one [type of] hard material layer,  
the carbon layers include at least one [type of] carbon layer, and  
the silicon layers include at least one [type of] silicon layer.

85. (Amended) The multilayer structure according to claim 84, wherein:  
the hard material layers include one [type of] hard material layer,  
the carbon layers include one [type of] carbon layer, and  
the silicon layers include one [type of] silicon layer.